



Seq list.ST25.txt
SEQUENCE LISTING

<110> Valentis, Inc.
Nordstrom, Jeff
Freimark, Bruce
Deshpande, Deepa

<120> Gene Expression and Delivery Systems and Uses

<130> 213-0063US

<140> US 09/754,014

<141> 2001-01-03

<150> US 08/948,958

<151> 1997-10-10

<150> US 60/028,687

<151> 1996-10-10

<160> 19

<170> PatentIn version 3.3

<210> 1

<211> 328

<212> PRT

<213> Homo sapiens

<400> 1

Met Cys His Gln Gln Leu Val Ile Ser Trp Phe Ser Leu Val Phe Leu
1 5 10 15

Ala Ser Pro Leu Val Ala Ile Trp Glu Leu Lys Lys Asp Val Tyr Val
20 25 30

Val Glu Leu Asp Trp Tyr Pro Asp Ala Pro Gly Glu Met Val Val Leu
35 40 45

Thr Cys Asp Thr Pro Glu Glu Asp Gly Ile Thr Trp Thr Leu Asp Gln
50 55 60

Ser Ser Glu Val Leu Gly Ser Gly Lys Thr Leu Thr Ile Gln Val Lys
65 70 75 80

Glu Phe Gly Asp Ala Gly Gln Tyr Thr Cys His Lys Gly Gly Glu Val
85 90 95

Leu Ser His Ser Leu Leu Leu Leu His Lys Lys Glu Asp Gly Ile Trp
100 105 110

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Ser Thr Asp Ile Leu Lys Asp Gln Lys Glu Pro Lys Asn Lys Thr Phe
 115 120 125

Leu Arg Cys Glu Ala Lys Asn Tyr Ser Gly Arg Phe Thr Cys Trp Trp
 130 135 140

Leu Thr Thr Ile Ser Thr Asp Leu Thr Phe Ser Val Lys Ser Ser Arg
 145 150 155 160

Gly Ser Ser Asp Pro Gln Gly Val Thr Cys Gly Ala Ala Thr Leu Ser
 165 170 175

Ala Glu Arg Val Arg Gly Asp Asn Lys Glu Tyr Glu Tyr Ser Val Glu
 180 185 190

Cys Gln Glu Asp Ser Ala Cys Pro Ala Ala Glu Glu Ser Leu Pro Ile
 195 200 205

Glu Val Met Val Asp Ala Val His Lys Leu Lys Tyr Glu Asn Tyr Thr
 210 215 220

Ser Ser Phe Phe Ile Arg Asp Ile Ile Lys Pro Asp Pro Pro Lys Asn
 225 230 235 240

Leu Gln Leu Lys Pro Leu Lys Asn Ser Arg Gln Val Glu Val Ser Trp
 245 250 255

Glu Tyr Pro Asp Thr Trp Ser Thr Pro His Ser Tyr Phe Ser Leu Thr
 260 265 270

Phe Cys Val Gln Val Gln Gly Lys Ser Lys Arg Glu Lys Lys Asp Arg
 275 280 285

Val Phe Thr Asp Lys Thr Ser Ala Thr Val Ile Cys Arg Lys Asn Ala
 290 295 300

Ser Ile Ser Val Arg Ala Gln Asp Arg Tyr Tyr Ser Ser Ser Trp Ser
 305 310 315 320

Glu Trp Ala Ser Val Pro Cys Ser
 325

<210> 2
 <211> 987
 <212> DNA

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<213> homo sapiens

<400> 2

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atgtgtcacc agcagttggt catctcttgg ttttcctgg tttttctggc atctcccctc      60
gtggccatat gggaaactgaa gaaagatggt tatgtcgtag aattggattg gtatccggat      120
gccctggag aaatggtggt cctcacctgt gacaccctg aagaagatgg tatcacctgg      180
accttgacc agagcagtga ggtcttaggc tctggcaaaa cctgaccat ccaagtcaaa      240
gagtttggag atgctggcca gtacacctgt cacaaggag gcgaggttct aagccattcg      300
ctctgctgc ttcacaaaaa ggaagatgga atttggtcca ctgatatttt aaaggaccag      360
aaagaacca aaaataagac ctttctaaga tgcgaggcca agaattattc tggacgtttc      420
acctgctggt ggctgacgac aatcagtact gatttgacat tcagtgtcaa aagcagcaga      480
ggctcttctg accccaagg ggtgacgtgc ggagctgcta cactctctgc agagagagtc      540
agaggggaca acaaggagta tgagtactca gtggagtgcc aggaggacag tgcctgcca      600
gctgctgagg agagtctgcc cattgaggtc atggtggatg ccgttcacaa gctcaagtat      660
gaaaactaca ccagcagctt cttcatcagg gacatcatca aacctgacc acccaagaac      720
ttgcagctga agccattaa gaattctcgg cagggtggagg tcagctggga gtaccctgac      780
acctggagta ctccacattc ctacttctcc ctgacattct gcgttcaggt ccagggcaag      840
agcaagagag aaaagaaaga tagagtcttc acggacaaga cctcagccac ggtcatctgc      900
cgcaaaaatg ccagcattag cgtgcgggcc caggaccgct actatagctc atcttgagc      960
gaatgggcat ctgtgccctg cagttag      987

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<210> 3

<211> 987

<212> DNA

<213> artificial sequence

<220>

<223> codon optimized Human IL-12 p40

<400> 3

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atgtgccacc agcagctggt gatcagctgg ttcagcctgg tgttcctggc cagccccctg      60
gtggccatct gggagctgaa gaaggacgtg tacgtggtgg agctggactg gtaccccgac      120
gccccggcg agatggtggt gctgacctgc gacacccccg aggaggacgg catcacctgg      180
accctggacc agagcagcga ggtgctgggc agcggcaaga ccctgaccat ccaggtgaag      240
gagttcggcg acgccggcca gtacacctgc cacaagggcg gcgagggtgct gagccacagc      300
ctgctgctgc tgcacaagaa ggaggacggc atctggagca ccgacatcct gaaggaccag      360

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aaggagccca agaacaagac cttcctgcgc tgcgaggcca agaactacag cggccgcttc 420
acctgctggt ggctgaccac catcagcacc gacctgacct tcagcgtgaa gagcagcagg 480
ggcagcagcg acccccaggg cgtgacctgc ggcgccgcca ccctgagcgc cgagcgcgtg 540
cgcgggcgaca acaaggagta cgagtacagc gtggagtgcc aggaggacag cgcctgcccc 600
gccgccgagg agagcctgcc catcgagggt atggtggacg ccgtccacaa gctgaagtac 660
gagaactaca ccagcagctt cttcatccgc gacatcatca agcccgaccc cccaagaac 720
ctgcagctga agcccctgaa gaacagccgc caggtggagg tgagctggga gtaccccgac 780
acctggagca cccccacag ctacttcagc ctgaccttct gcgtgcaggt gcagggcaag 840
agcaagcgcg agaagaagga ccgcgtgttc accgacaaga ccagcgccac cgtgatctgc 900
cgcaagaacg ccagcatcag cgtgcgcgcc caggaccgct actacagcag cagctggagc 960
gagtgggcca gcgtgccctg cagctag 987

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<210> 4

<211> 987

<212> DNA

<213> artificial sequence

<220>

<223> codon optimized human IL-12 p40

<400> 4

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gcccccggcg agatggtggt cctgacctgc gacacccccg aggaagacgg catcacctgg 180
accctggacc agagcagtga ggtgctgggc tccggcaaga ccctgaccat ccaggtgaag 240
gagttcggcg acgccggcca gtacacctgc cacaagggag gcgaggtgct gagccactcc 300
ctcctgctgc tccacaaaaa ggaggacggc atctggagca ccgacatcct gaaggaccag 360
aaggagccca agaacaagac cttcctgcgc tgcgaggcca agaactacag cggccgcttc 420
acctgctggt ggctgaccac gatcagcacc gacctgacct tcagtgtgaa gagcagcagg 480
ggctccagcg acccccaggg cgtgacctgc ggcgctgcca ccctgagcgc cgagcgcgtg 540
cgcgggcgaca acaaggagta cgagtacagc gtggagtgcc aggaagactc cgcctgcccc 600
gccgctgagg agagcctgcc catcgagggt atggtggacg ccgttcacaa gctgaagtac 660
gagaactaca ccagcagctt cttcatccgc gacatcatca agcctgaccc acccaagaac 720
ctccagctga agcccctcaa gaactccgc caggtggagg tgagctggga gtaccccgac 780
acctggagca cgccccactc ctacttctcc ctgaccttct gcgtgcaggt ccagggcaag 840

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agcaagcgcg agaagaaaga cggggtgttc accgacaaga ccagcgccac cgtcatctgc 900
cgcaagaacg ccagcatcag cgtgcgcgcc caggaccgct actatagctc ctcttgagc 960
gagtgggcca gcgtgccctg ctcctag 987

```

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<210> 5
<211> 219
<212> PRT
<213> homo sapiens

```

```

<400> 5

```

```

Met Cys Pro Ala Arg Ser Leu Leu Leu Val Ala Thr Leu Val Leu Leu
1          5          10          15

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Asp His Leu Ser Leu Ala Arg Asn Leu Pro Val Ala Thr Pro Asp Pro
          20          25          30

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Gly Met Phe Pro Cys Leu His His Ser Gln Asn Leu Leu Arg Ala Val
          35          40          45

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Ser Asn Met Leu Gln Lys Ala Arg Gln Thr Leu Glu Phe Tyr Pro Cys
          50          55          60

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Thr Ser Glu Glu Ile Asp His Glu Asp Ile Thr Lys Asp Lys Thr Ser
65          70          75          80

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```

Thr Val Glu Ala Cys Leu Pro Leu Glu Leu Thr Lys Asn Glu Ser Cys
          85          90          95

```

```

Leu Asn Ser Arg Glu Thr Ser Phe Ile Thr Asn Gly Ser Cys Leu Ala
          100          105          110

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Ser Arg Lys Thr Ser Phe Met Met Ala Leu Cys Leu Ser Ser Ile Tyr
          115          120          125

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Glu Asp Leu Lys Met Tyr Gln Val Glu Phe Lys Thr Met Asn Ala Lys
          130          135          140

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Leu Leu Met Asp Pro Lys Arg Gln Ile Phe Leu Asp Gln Asn Met Leu
          145          150          155          160

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Ala Val Ile Asp Glu Leu Met Gln Ala Leu Asn Phe Asn Ser Glu Thr
          165          170          175

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Seq list.ST25.txt

Val Pro Gln Lys Ser Ser Leu Glu Glu Pro Asp Phe Tyr Lys Thr Lys
 180 185 190

Ile Lys Leu Cys Ile Leu Leu His Ala Phe Arg Ile Arg Ala Val Thr
 195 200 205

Ile Asp Arg Val Thr Ser Tyr Leu Asn Ala Ser
 210 215

<210> 6
 <211> 660
 <212> DNA
 <213> homo sapiens

<400> 6
 atgtgtccag cgcgagcct cctccttggt gctaccctgg tcctcctgga ccacctcact 60
 ttggccagaa acctccccgt ggccactcca gaccaggaa tgttcccatg ccttcaccac 120
 tcccaaaacc tgctgagggc cgtcagcaac atgctccaga aggccagaca aactctagaa 180
 ttttaccctt gcacttctga agagattgat catgaagata tcacaaaaga taaaaccagc 240
 acagtggagg cctgtttacc attggaatta accaagaatg agagttgcct aaattccaga 300
 gagacctctt tcataactaa tgggagttgc ctggcctcca gaaagacctc ttttatgatg 360
 gccctgtgcc ttagtagtat ttatgaagac ttgaagatgt accaggtgga gttcaagacc 420
 atgaatgcaa agcttctgat ggatcctaag aggcagatct ttctagatca aaacatgctg 480
 gcagttattg atgagctgat gcaggccctg aatttcaaca gtgagactgt gccacaaaaa 540
 tcctcccttg aagaaccgga tttttataaa actaaaatca agctctgcat acttcttcat 600
 gctttcagaa ttcgggcagt gactattgac agagtgcga gctatctgaa tgcttcctaa 660

<210> 7
 <211> 660
 <212> DNA
 <213> artificial sequence

<220>
 <223> Codon optimized Human IL-12 p35

<400> 7
 atgtgccccg cccgcagcct gctgctggtg gccaccctgg tgctgctgga ccacctgagc 60
 ctggccccga acctgcccgt ggccaccccc gaccccgga tgttcccctg cctgcaccac 120
 agccagaacc tgctggcggc cgtgagcaac atgctgcaga aggccgcgca gacctggag 180
 ttctaccctt gcaccagcga ggagatcgac cacgaggaca tcaccaagga caagaccagc 240
 accgtggagg cctgcctgcc cctggagctg accaagaacg agagctgcct gaacagccgc 300

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gagaccagct tcatcaccaa cggcagctgc ctggccagcc gcaagaccag cttcatgatg 360
gccctgtgcc tgagcagcat ctacgaggac ctgaagatgt accaggtgga gttcaagacc 420
atgaacgcca agctgctgat ggaccccaag ctccagatct tcctggacca gaacatgctg 480
gccgtgatcg acgagctgat gcaggccctg aacttcaaca gcgagaccgt gccccagaag 540
agcagcctgg aggagcccga cttctacaag accaagatca agctgtgcat cctgctgcac 600
gccttccgca tccgcgccgt gaccatcgac cgcgtgacca gctacctgaa cgccacctga 660

<210> 8

<211> 660

<212> DNA

<213> artificial sequence

<220>

<223> codon optimized Human IL-12 p35

<400> 8

atgtgccccg cccgcagcct gctgctcgtg gccaccctgg tgctcctgga ccacctcagc 60
ctggccccga acctccccgt ggccacccca gaccccgga tgttcccatg cctgcaccac 120
agccagaacc tgctggcggc cgtgagcaac atgctgcaga aggccgcgca gacctggag 180
ttctaccctt gcaccagcga ggagatcgac cagcaggaca tcaccaagga caagaccagc 240
accgtggagg cctgcctgcc cctcgagtta accaagaacg agagctgcct caacagccgc 300
gagacctctt tcatcaccaa cggcacttgc ctggcctccc gcaagaccag cttcatgatg 360
gccctgtgcc tgagctccat ctacgaggac ctgaagatgt accaggtgga gttcaagacc 420
atgaacgcca agctcctgat ggaccccaag ctccagatct tcctggacca gaacatgctg 480
gccgtgatcg acgagctgat gcaggccctg aacttcaaca gcgagaccgt gccccagaag 540
agcagcctgg aggagcccga cttctacaag accaagatca agctgtgcat cctgctgcac 600
gccttccgca tccgggccgt gaccatcgac cgcgtgacca gctacctgaa cgccacgtga 660

<210> 9

<211> 58

<212> DNA

<213> artificial sequence

<220>

<223> synthetic 5' UTR

<400> 9

aagcttactc aacacaataa caaacttact tacaatctta attaacaggc caccatgg 58

<210> 10

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<211> 45
 <212> DNA
 <213> artificial sequence

<220>
 <223> synthetic intron where tract of random nucleotides not shown

<220>
 <221> misc_feature
 <222> (1)..(9)
 <223> 5' splice site, where actual splice between nucleotide 3 and 4

<220>
 <221> misc_feature
 <222> (10)..(15)
 <223> optional restriction enzyme site

<220>
 <221> misc_feature
 <222> (15)..(16)
 <223> between 15 and 16 is the location of random sequence

<220>
 <221> misc_feature
 <222> (16)..(22)
 <223> branch point, where the actual branch point is nucleotide #21

<220>
 <221> misc_feature
 <222> (25)..(45)
 <223> 3' splice site, where the actual 3' splice is between nucleotide 44 and 45

<400> 10
 caggtaagtg tcttctacta acggttcttt ttttctcttc acagg 45

<210> 11
 <211> 16
 <212> DNA
 <213> Artificial

<220>
 <223> consensus 3' intron splice site,

<220>
 <221> misc_feature
 <222> (1)..(16)
 <223> The letter "N" can be any base.

The letter "Y" can be C or T.

<400> 11
 yyyyyyyyyy ynyagg 16

<210> 12

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<211> 271
<212> DNA
<213> artificial

<220>
<223> artificial Poly A site 2XPA

<400> 12
tctagagcat ttttcctct gccaaaaatt atggggacat catgaagccc cttgagcatc      60
tgacgtctgg ctaataaagg aaatttattt tcattgcaat agtgtgttgg aattttttgt      120
gtctctcact cggtagtaga gcatttttcc ctctgccaaa aattatgggg acatcatgaa      180
gcccttgag catctgacgt ctggctaata aaggaaattt attttcattg caatagtgtg      240
ttggaatttt ttgtgtctct cactcggtac c                                     271

<210> 13
<211> 122
<212> DNA
<213> artificial

<220>
<223> synthetic intron

<220>
<221> misc_feature
<222> (1)..(9)
<223> 5' splice site, where the actual 5' splice site is between
nucleotide 3 and 4

<220>
<221> misc_feature
<222> (10)..(15)
<223> optional restriction enzyme site

<220>
<221> misc_feature
<222> (16)..(92)
<223> "n" = random nucleotides, including optional restriction enzyme
sites

<220>
<221> misc_feature
<222> (93)..(99)
<223> branch point, where the actual branch point is nucleotide #98

<220>
<221> misc_feature
<222> (102)..(122)
<223> 3' splice site, where the actual 3' splice site is between
nucleotides 121 and 122

<400> 13
caggtaagtg tcttcnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn      60

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nnnnnnnnnnn nnnnnnnnnnn nnnnnnnnnnn nntactaacg gttctttttt tctcttcaca 120

gg 122

<210> 14

<211> 9

<212> DNA

<213> artificial

<220>

<223> consensus 5' splice site

<220>

<221> misc

<222> (1)..(1)

<223> The letter "m" stands for C or A.

<220>

<221> misc

<222> (3)..(4)

<223> actual '5 splice site

<220>

<221> misc

<222> (6)..(6)

<223> The letter "R" stands for G or A

<400> 14

maggtragt

9

<210> 15

<211> 9

<212> DNA

<213> artificial

<220>

<223> OPTIVS8 5' splice site

<220>

<221> misc_feature

<222> (3)..(4)

<223> Actual splice site between nucleotides 3 and 4

<400> 15

caggtaagt

9

<210> 16

<211> 7

<212> DNA

<213> artificial

<220>

<223> consensus mammalian branch point

Seq list.ST25.txt

<220>
 <221> misc_feature
 <222> (1)..(7)
 <223> The letter "Y" stands for C or T.
 The letter "R" stands for A or G.

The letter "N" stands for any base.

<220>
 <221> misc_feature
 <222> (6)..(6)
 <223> Actual branch point

<400> 16
 ynytray

7

<210> 17
 <211> 7
 <212> DNA
 <213> artificial

<220>
 <223> OPTIVS8 branch point

<400> 17
 tactaac

7

<210> 18
 <211> 21
 <212> DNA
 <213> artificial

<220>
 <223> 3' splice, with polypyrimidine tract extended to 16 bases

<220>
 <221> misc_feature
 <222> (1)..(16)
 <223> The letter "Y" stands for C or T.

<220>
 <221> misc_feature
 <222> (17)..(17)
 <223> The letter "N" stands for any base.

<220>
 <221> misc_feature
 <222> (18)..(18)
 <223> The letter "Y" stands for C or T.

<220>
 <221> misc_feature
 <222> (20)..(21)
 <223> Actual 5' splice site

Seq list.ST25.txt

<400> 18
yyyyyyyyyy yyyyyynyag g

21

<210> 19
<211> 21
<212> DNA
<213> artificial

<220>
<223> OPTIVS8 3' splice site with 7 consecutive Ts

<220>
<221> misc_feature
<222> (17)..(17)
<223> The letter "N" stands for any base.

<220>
<221> misc_feature
<222> (18)..(18)
<223> The letter "Y" stands for C or T.

<400> 19
ttcttttttt ctcttcnyag g

21